

Appl. No. 10/809,987  
Ans. Dated November 8, 2005  
Reply to Office Action of May 17, 2005 and Examiner's  
telephone conference of 11/8/05

**Amendment to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claim 1 (previously presented): In a mesh network that employs a hierarchical digital transmission standard, a method of operating a node to handle link failure, said method comprising:

detecting failure of a data communication link at a second hierarchical layer, wherein said link is employed by a plurality of paths defined at a first hierarchical layer above said second hierarchical layer;

signaling local repair of said failure using overhead information of said second hierarchical layer only without flooding throughout said mesh network; and

switching only protected ones of said plurality of paths to alternate routes through said network to avoid said failure.

Claim 2 (canceled):

Claim 3 (canceled):

Claim 4 (currently amended): The method of claim 2\_1 wherein said at least one of said plurality of paths is protected and at least one of said plurality of paths is unprotected.

Claim 5 (currently amended): The method of claim 2\_1 wherein said first hierarchical layer comprises STS-1 communications and said second hierarchical layer comprises OC-n communications.

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**Claim 6 (currently amended):** The method of claim 2 1 wherein said first hierarchical layer comprises VT1.5 communications and said second hierarchical layer comprises STS-1 communications.

**Claim 7 (currently amended):** The method of claim 2 1 further comprising:  
pre-configuring which ones of said plurality of paths are protected.

**Claim 8 (currently amended):** The method of claim 2 1 further comprising:  
pre-configuring protection routes for said plurality of protected paths.

**Claim 9 (previously presented):** In a mesh network that employs a hierarchical digital transmission standard, apparatus for operating a node to handle link failure, said apparatus comprising:

means for detecting failure of a data communication link at a second hierarchical layer, wherein said link is employed by a plurality of paths defined at a first hierarchical layer above said second hierarchical layer;

means for signaling local repair of said failure using overhead information of said second hierarchical layer only without flooding throughout said mesh network; and

means for switching only protected ones of said plurality of paths to alternate routes through said network to avoid said failure.

**Claim 10 (canceled):**

**Claim 11 (canceled):**

**Claim 12 (canceled):**

**Claim 13 (currently amended):** The apparatus of claim 10 9 wherein said first hierarchical layer comprises STS-1 communications and said second hierarchical layer comprises OC-n communications.

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**Claim 14 (currently amended):** The apparatus of claim 10 9 wherein said first hierarchical layer comprises VT1.5 communications and said second hierarchical layer comprises STS-1 communications.

**Claim 15 (original):** The apparatus of claim 10 9 further comprising:  
means for pre-configuring which ones of said plurality of paths are protected.

**Claim 16 (original):** The apparatus of claim 10 9 further comprising:  
means for pre-configuring protection routes for said plurality of protected paths.

**Claim 17 (original):** In a network that employs a hierarchical digital transmission standard, apparatus for operating a node to handle link failure, said apparatus comprising:  
a processor;

a memory storing instructions for execution by said processor, said instructions comprising:

code that causes detection of failure of a data communication link defined at a second hierarchical layer, wherein said link is employed by a plurality of paths defined at a first hierarchical layer above said second hierarchical layer;

code that causes signaling of local repair of said failure using overhead information of said second hierarchical layer; and

code that causes switching of only protected ones of said plurality of paths to alternate routes through said network to avoid said failure.

**Claim 18 (original):** The apparatus of claim 17 wherein said network comprises a mesh network.

**Claim 19 (original):** The apparatus of claim 18 wherein said code that causes signaling comprises:

code that causes signaling without flooding throughout said mesh network.

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**Claim 20 (original):** The apparatus of claim 18 wherein said at least one of said plurality of paths is protected and at least one of said plurality of paths is unprotected.

**Claim 21 (original):** The apparatus of claim 18 wherein said first hierarchical layer comprises STS-1 communications and said second hierarchical layer comprises OC-n communications.

**Claim 22 (original):** The apparatus of claim 18 wherein said first hierarchical layer comprises VT1.5 communications and said second hierarchical layer comprises STS-1 communications.

**Claim 23 (original):** The apparatus of claim 18 wherein said instructions further comprise:

code that causes preconfiguration of which ones of said plurality of paths are protected.

**Claim 24 (original):** The apparatus of claim 18 wherein said instructions further comprise:

code that causes preconfiguration of protection routes for said plurality of protected paths.

**Claim 25 (original):** In a network that employs a hierarchical digital transmission standard, a computer program product for operating a node to handle link failure, said computer program product comprising:

code that causes detection of failure of a data communication link defined at a second hierarchical layer, wherein said link is employed by a plurality of paths defined at a first hierarchical layer above said second hierarchical layer;

code that causes signaling of local repair of said failure using overhead information of said second hierarchical layer below said first hierarchical layer;

code that causes switching of only protected ones of said plurality of paths to alternate routes through said network to avoid said failure; and

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a computer-readable storage medium that stores the codes.

**Claim 26 (previously presented):** In a mesh network that employs a hierarchical digital transmission standard, a method of operating a node to handle link failure, said method comprising:

detecting failure of a data communication link at a second hierarchical layer, wherein said link is employed by a plurality of paths defined at a first hierarchical layer above said second hierarchical layer;

signaling local repair of said failure using overhead information of said second hierarchical layer without flooding throughout said mesh network; and

switching only protected ones of said plurality of paths to alternate routes through said network to avoid said failure.

**Claim 27 (previously presented):** In a mesh network that employs a hierarchical digital transmission standard, a method of operating a node to handle link failure, said method comprising:

detecting failure of a data communication link at a second hierarchical layer comprising STS-1 communications, wherein said link is employed by a plurality of paths defined at a first hierarchical layer comprising VT1.5 communications above said second hierarchical layer;

signaling local repair of said failure using overhead information of said second hierarchical layer; and

switching only protected ones of said plurality of paths to alternate routes through said network to avoid said failure.

**Claim 28 (previously presented):** In a network that employs a hierarchical digital transmission standard, a method of operating a node to handle link failure, said method comprising:

detecting failure of a data communication link at a second hierarchical layer, wherein said link is employed by a plurality of paths defined at a first hierarchical layer above said second hierarchical layer;

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signaling local repair of said failure using overhead information of said second hierarchical layer;  
pre-configuring which ones of said plurality of paths are protected; and  
switching only protected ones of said plurality of paths to alternate routes through said network to avoid said failure.

**Claim 29 (previously presented):** In a network that employs a hierarchical digital transmission standard, a method of operating a node to handle link failure, said method comprising:

detecting failure of a data communication link at a second hierarchical layer, wherein said link is employed by a plurality of paths defined at a first hierarchical layer above said second hierarchical layer;

signaling local repair of said failure using overhead information of said second hierarchical layer;

pre-configuring protection routes for said plurality of protected paths; and  
switching only protected ones of said plurality of paths to protection routes through said network to avoid said failure.

**Claim 30 (previously presented):** In a mesh network that employs a hierarchical digital transmission standard, apparatus for operating a node to handle link failure, said apparatus comprising:

means for detecting failure of a data communication link at a second hierarchical layer, wherein said link is employed by a plurality of paths defined at a first hierarchical layer above said second hierarchical layer;

means for signaling local repair of said failure using overhead information of said second hierarchical layer signaling without flooding throughout said mesh network; and

means for switching only protected ones of said plurality of paths to alternate routes through said network to avoid said failure.

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**Claim 31 (previously presented):** In a network that employs a hierarchical digital transmission standard, apparatus for operating a node to handle link failure, said apparatus comprising:

means for detecting failure of a data communication link at a second hierarchical layer comprising STS-1 communications, wherein said link is employed by a plurality of paths defined at a first hierarchical layer comprising VT1.5 communications above said second hierarchical layer;

means for signaling local repair of said failure using overhead information of said second hierarchical layer; and

means for switching only protected ones of said plurality of paths to alternate routes through said network to avoid said failure.

**Claim 32 (previously presented):** In a network that employs a hierarchical digital transmission standard, apparatus for operating a node to handle link failure, said apparatus comprising:

means for detecting failure of a data communication link at a second hierarchical layer, wherein said link is employed by a plurality of paths defined at a first hierarchical layer above said second hierarchical layer;

means for signaling local repair of said failure using overhead information of said second hierarchical layer;

means for pre-configure which ones of said plurality of paths are protected; and

means for switching only protected ones of said plurality of paths to alternate routes through said network to avoid said failure.

**Claim 33 (previously presented):** In a network that employs a hierarchical digital transmission standard, apparatus for operating a node to handle link failure, said apparatus comprising:

means for detecting failure of a data communication link at a second hierarchical layer, wherein said link is employed by a plurality of paths defined at a first hierarchical layer above said second hierarchical layer;

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means for signaling local repair of said failure using overhead information of said second  
hierarchical layer;

means for pre-configuring protection routes for said plurality of protected paths; and  
means for switching only protected ones of said plurality of paths to protection routes  
through said network to avoid said failure.

**Claim 34 (new):** The apparatus of claim 9 wherein said at least one of said plurality of  
paths is protected and at least one of said plurality of paths is unprotected.